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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/186,388 11/05/98 LEE

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GEORGE O SAILE  
STEPHEN B ACKERMAN  
20 MCINTOSH DRIVE  
POUGHKEEPSIE NY 12603

EXAMINER

PERALTA, G

ART UNIT

PAPER NUMBER

2814

DATE MAILED:

11/20/00

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

09/186,388

Applicant(s)

LEE ET AL.

Examiner

Ginette Peralta

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 06 September 2000.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

## Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 18) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other:

DETAILED ACTION

*Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Current (U.S. Pat. 5,155,369) in view of Aitken (U.S. Pat. 4,578,589).

Current teaches a method of forming source/drain regions, comprising the steps of providing a semiconductor integrated circuit wafer having a gate electrode and source/drain regions, providing an ion implant apparatus which is the Precision Implant 9200 from Applied Materials, adjusting the ion implant apparatus so that the ion implant apparatus produces an ion beam comprising  $P_2^+$  or  $As_2^+$  ions, wherein the ion beam has a beam density and a beam energy, implanting  $P_2^+$  or  $As_2^+$  ions into the gate electrode and the source/drain regions of the integrated circuit wafer using the ion implant beam, and annealing the integrated circuit wafer having the  $P_2^+$  or  $As_2^+$  ions implanted at an anneal temperature for an anneal time; wherein the adjusting the ion implant apparatus so that the ion implant apparatus produces an ion beam comprising one of  $P_2^+$  or  $As_2^+$  ions using a magnetic analyzer; wherein the beam density is between about  $10^{14}$  and  $10^{15}$  ions/cm<sup>2</sup> and the beam energy is 20 or 50 KeV; the anneal

temperature is between about 900 and 1100°C; the anneal time is between 1 and 30 seconds.

Current teaches all the limitations in the claims with the exception of placing a phosphorus or arsenic ion source in the ion implant apparatus, wherein the phosphorus ion source and the arsenic ion source comprises solid phosphorus and solid arsenic, respectively.

Aitken teaches an apparatus for ion implantation such as the one used in Current that comprises a solid arsenic and a solid phosphorus ion sources, and placing the ion source in the ion implant apparatus.

Thus, it would have been obvious to one of ordinary skill in the art to use a solid arsenic ion source or a solid phosphorus ion source in the ion implant apparatus as taught by Aitken in the invention of Current, as it is shows that it is well known and desirable in the art to the possibility of using a solid ion source in the apparatus used by Current in his invention and to vary the ranges for the beam density, beam energy, and anneal time as the values taught in Current encompass those of the claims, and it would not yield any unexpected results.

#### *Response to Arguments*

1. Applicant's arguments filed 9/6/00 have been fully considered but they are not persuasive.

With respect to Applicant's argument that Aitken in view of Current do not disclose a single ion implantation step, it is noted that the claims refer to implanting  $P_2^+$  or  $As_2^+$ ,

but not to a single step implantation process, the claims comprise an ion implantation of one of two species but the scope of the claim does not preclude a multi-step implantation of the species, therefore it would have been within the scope of one of ordinary skill in the art to implant the  $P_2^+$  or  $As_2^+$  in one or two steps as long as the integrity of the device is preserved, it is also noted that the two step implantation of Current is not incident in the same region, the first implantation is performed at an angle such that channeling effect is minimized when the actual source/drain region implantation is performed.

### *Conclusion*

2. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ginette Peralta whose telephone number is (703)305-7722. The examiner can normally be reached on Monday to Friday 8:00 AM-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald L. Monin can be reached on (703)308-4895. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7722 for regular communications and (703)308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

GP  
November 16, 2000

  
OLIK CHAUDHURI  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800